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TITLE: Low Band Telemedicine Decision Support System for
Disaster Situations

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MidTerm Overall Evaluation Report

PROPOSAL: 1999000221

TITLE: Low Band Telemedicine Decision Support System for Disaster Situations

1. ACCOMPLISHMENTS:

1. Project accomplishments as of the date of the report The first part of the project involves development of software in preparation for field testing of the trauma web-based decision support system. Dr. Aoki and others, who comprise the research team at Baylor College of Medicine, have developed a preliminary version of web and evidence-based decision support system (WEDS) that is accessible from a Palm device. A new web site (http://weds.it.bcm.tmc.edu:591/crush/P_index.htm) was created to serve this project. Commercially available software is used with a Palm V hand-held platform to access the web site via wireless modem. The server's HTML code has been designed to optimize the display of the WEDS internet page on the Palm computer. This will be the device tested in the field for triage of traumatically injured patients. It is currently configured so that the caregiver in the field is prompted to enter 4 data elements: patient name, elapsed time from injury to rescue, pulse rate and urine color (Figure 1). The caregiver then presses the displayed "calculate" button, initiating evaluation of the data on the server decision support system. Logistic regression analysis of the provided data requires approximately one second. The server then returns 2 pieces of information: the percent risk that this patient will develop crush syndrome or death and a suggested course of action, such as immediate transfer to the hospital. Caregivers will then triage victims based on the server's analysis, which is displayed on the remote Palm device (Figure 2). Another aspect of software development involves a server database for storing information on the patients. An initial version of the database has been created in Filemaker Pro. It was populated with 50 mock patient records and tested by remote access. We are in the process of migrating the database to Oracle 8.1.5, which includes high-level security and web capabilities. A web interface for the database will be created before the field test. The database will form the basis of a relational system for analysis of findings. We have 2 images which are unable to be placed here, but illustrate the manner in which information is gathered and disseminated. If you wish these sent we can email the graphic image. Figures 1 and 2: Web pages displayed on the wireless Palm device. Left, data entered in initial screen; right, server's result and recommendation.

2. PROBLEMS:

2. Problems/Issues encountered as of the date of the report No significant technical problems have been encountered to date. Financial information to include funds spent, obligated, cost savings, etc. Baylor could not bill for work performed during the first half of this project due to the administrative preparation of a valid subcontract. This has been completed recently and Baylor can now bill for the work completed for this project.

3. LIFE-CYCLE:

3. Plan for the second half of the project life-cycle We have planned following steps in the second half of the project cycle. 1. Complete development of an electronic database/medical record system for disaster care. 2. Develop a web-based message board for implementation in the WEDS system. The message board system will enable caregivers at different sites to communicate with each other so as to improve utilization of shared resources during triage. 3. Develop a Palm-based, stand-alone decision support system. This will be an XML-based Palm application that provides regression analysis and reporting similar to the server system. The Palm-based system will be used in the field during periods when wireless communication is not available. The patient data will be stored on the local device and downloaded to the server when the wireless internet connection is restored. 4. Field-test five palm devices. THIS IS N of 300 test, not 300 people...Three hundred volunteers will be instructed on how to act as patients and will be triaged using the WEDS system. Physical examination, data inputting, decision making and documentation will be done during the test. All process will be recorded and evaluated quantitatively.

4. DELIVERABLES:

4. Update of the status/nature of the deliverable as identified in the original proposal (1) Develop a web-based decision support system (WEDS) combined with computerized patients records (CPR) for disaster situations. The web-based decision support system has been developed and a preliminary version of the patient record database was created. Additional programming is still required to make the database interactive. (2) Develop a wireless, multi-user communication system (message board) to facilitate information exchange between rescue workers and a central command site. Pending. (3) Field test the wireless, web-based system Planning for a November, 2000, field test is underway. (4) Develop the web-based clinical and research support system applications for existing handheld devices and use test data to further optimize the WEDS/CPR system. Additional web-enabled software will be developed based on results of the upcoming field test.